

Indian Institute of Technology Madras

Department of Computer Science and Engineering

Report for Department Degree Distribution Program on 30th September, 2019

The Department has a vibrant student body numbering around 600 and faculty numbering 31. The full-time faculty currently consists of 14 Professors, 6 Associate Professors and 11 Assistant Professors. The current faculty include 2 Fellows of IEEE, 4 Fellows of Indian National Academy of Engineers (INAE), 1 Fellow of Indian National Science Academy (INSA) and 1 Fellow of Computer Society of India. The current faculty also include 2 awardees of the Srimathi Marti Annapurna Gurunath Award for Excellence in Teaching, 1 awardee of the Institute Research and Development Mid-Career Award, and 5 awardees of the Young Faculty Recognition Award. The current faculty also include 3 Institute Chairs. The Department has Prof.Mriganka Sur from MIT, USA and Prof.Partha P. Mitra from Cold Spring Harbor Laboratory, USA as Distinguished Chair Professors in Computational Brain Research instituted by Mr.Kris Gopalakrishnan. The Department has Prof.David Peleg from Weizmann Institute of Science, Israel, Prof.Vyas Sekar from CMU, USA and Prof.Vijay Raghunathan from Purdue University, USA, as Visiting Chair Professors instituted by two alumni, Venky Harinarayan and Anand Rajaraman. During the academic year 2018-2019, one faculty member, Prof.Timothy A. Gonsalves, has superannuated. Two faculty members, Dr.K.C.Sivaramakrishnan and Dr.Arun Rajkumar, joined as Assistant Professors. Dr.Fabrice Mouhartem joined the Department as a Young International Faculty.

The Department presently offers B.Tech. programme, dual-degree B.Tech./M.Tech. programme, M.Tech. M.S., Ph.D., dual M.Tech.-Ph.D. and dual M.S.-Ph.D. degree programmes. There are about 200 B.Tech. students, 75 dual-degree B.Tech./M.Tech. students, 120 M.Tech. students, 75 M.S. students and 90 Ph.D. students. The Department also offers a web based M.Tech. programme on Information Security for employees of companies, with about 30 students admitted per year. Another web based M.Tech. programme on Large Scale Compute System Design will be offered from January 2020.

The total number of graduands for the academic year 2018-2019 is 147. The number of graduands in different degree programmes is as follows: 7 Ph.D. graduands, 28 M.S. graduands, 48 M.Tech. graduands, 28 dual-degree B.Tech.-M.Tech. graduands and 36 B.Tech. graduands.

Out of about 150 Ph.Ds graduated from the Department so far, 97 of them are in Indian academia, 26 in Indian industries, 19 in academia abroad and 7 in industries abroad. Several alumni of the Department hold important positions in the academia and industry worldwide. According to a Brown University study reported in May 2014, IIT Madras was the fifth largest contributor of faculty members to the Computer Science Programmes in U.S. universities including MIT, Stanford and Yale.

The faculty and research scholars of the Department are actively engaged in research activities in several areas of current research topics in Computer Science and Engineering. During the calendar year 2018, totally 95 research papers have been published. These include 27 in International Journals, 7 in National Journals, 48 in International Conferences, 11 in National Conferences and 2 Book Chapters. The papers published in International Conferences include several papers published in Core Australasia A* and A rated conferences.

During the academic year 2018-2019, the faculty and students of the Department have won several awards. Prof.V.Kamakoti received the following awards: (1) VASVIK Research Award for 2017, (2) ACCS_CDAC Foundation Award for 2018 and (3) Techno Visual Award from Indian Electronics and Semiconductors Association. The students of the Department received the following awards:

- (1) Best Student Video award in ICCBR 2018 Video Competition by PhD student Devi Ganesan
- (2) Best Student Paper in ACIVS 2018 Conference by PhD student Geethu Mariam Jacob
- (3) Best Student Paper in CVIP 2019 Conference by MS student Saptakatha Adak
- (4) 2nd Prize in Young Researcher Forum at SPAC Conference by MS student Himanshi Jain,
- (5) 1st Prize in Applied Research Contest at CSAW 2018 Conference by PhD student V. Prasanna Karthik
- (6) Best poster runner-up award at ACM MobiCom 2018 Conference by PhD student Revathy Narayanan
- (7) Bronze medal in Student Research Competition at ACM MobiCom 2018 by PhD student Revathy Narayanan
- (8) A team of 3 students of IIT Madras that includes two B.Tech. (CSE) students Teja Vardhana Reddy and Pranav Gavvaji, and coached by Dr.Rupesh Nasre qualified for the International Collegiate Programming Competition (ICPC) World Finals. The team was placed 41st in the ICPC World finals.
- (9) A team of 3 students of IIT Madras that includes the B.Tech. student Rajat Singhal won the First prize in the Microsoft Codefundo++ National Challenge.
- (10) Team of PhD students Gargi Mitra and V.Prasanna Karthik was placed first in the contest "Gandhi-Hazare Award – Reducing Corruption Through Technology" held by the Center for Social Innovation and Entrepreneurship (CSIE) of IIT Madras

During the financial year of 2018-2019, 16 sponsored research projects with a total budget of Rs. 720 Lakhs have been sanctioned. These projects include 4 VAJRA projects and 2 IMPRINT projects. The major sponsored projects include the project on Computational Methods for Multi-Tissue Models of Health and Disease with a budget of Rs.355 Lakhs sponsored by Wellcome Trust, UK, with Dr.Manikandan Narayanan as the Principal Investigator, and the project on Computing on Encrypted Data: New Paradigms in Functional Encryption with a budget of Rs.51 Lakhs sponsored by Indo-French Center for Promotion of Advanced Research with Dr.Shweta Agrawal as the Principal Investigator.

During the financial year of 2018-2019, the number of ongoing and new industrial consultancy projects is 21 with a total budget of Rs.797 Lakhs. The major consultancy projects include the project on Safety Critical Standard based on SHAKTI Framework with a budget of Rs.167 Lakhs sponsored by Thales Research Technology Limited with Prof.V.Kamakoti as the Principal Investigator, the project on Learning Representations on Network Data with a budget of Rs.108 Lakhs sponsored by Intel Technology India Private Limited with Prof. B.Ravindran as the Principal Investigator, and the project on Development of Machine Learning Algorithms to Model Semiconductor Fab Manufacturing Process with a budget of Rs. 95 lakhs sponsored by Applied Materials India Private Limited with Prof.B.Ravindran as the Principal Investigator.

The faculty of the Department have been involved in organization of 7 conferences, workshops, and symposia during the academic year 2018-2019. Prof.Hema A. Murthy was a Technical Program Chair and Prof.C.Chandra Sekhar was a General Co-Chair of the INTERSPEECH conference conducted for the first time in India at Hyderabad in September 2018. Dr.Shweta Agrawal was the General Co-Chair of the Theory of Cryptography Conference conducted at Goa in November 2018. Dr.Chester Rebeiro was the Program Co-Chair of the International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE) conducted at Kanpur in December 2018. Dr.Rupesh Nasre organized the NVIDIA-IITM Hackathon at IIT Madras in January 2019. Prof.B.Ravindran organized a workshop on "Skilling India for AI" in collaboration with NITI Aayog and NASSCOM in September 2018, the Microsoft Research Academic Summit in January 2019 and the first RBCDSAI Web Science Symposium in February 2019.

The international engagements by the faculty of the Department during the academic year 2018-2019 include visits by the faculty to universities abroad for research collaboration. Dr.Venkata Krishna Nandivada was on sabbatical leave to work at University of Texas at Austin, USA, from August 2018 to July 2019. Dr.John E. Augustine was on sabbatical leave to work at National University of Singapore from August 2018 to July 2019. Prof.D.Janakiram worked at Rochester Institute of Technology, New York, for one semester starting from August 2018. Prof.C.Pandurangan visited North Eastern University, Boston, USA during May-June 2018. Dr.B.V.Raghavendra Rao visited Hannover, Germany in October 2018 for project discussions. Prof.Krishna Sivalingam visited National Chiao Tung University, Taiwan, in November 2018 for research collaboration. Dr.Pratyush Kumar visited Seoul National University and Ajou University

Seoul in December 2018 to give invited talks. Dr.Chester Rebeiro visited Tel Aviv University, Isreal, in May 2019 for research collaboration. Prof. Hema A. Murthy visited Carnegie Mellon University and Simon Center for Social Brain, USA, in May-June 2019 for research collaboration. Prof.B.Ravindran visited A-Star Institute of Infocomm Research, Singapore and 4 universities in USA in May 2019 for research collaboration. Dr.Shweta Agrawal visited Weizmann Institute and Technion University, Israel, in June 2019, for research collaboration.

The faculty of the Department have been engaged in editorial activities of international journals. Prof.Madhu Mutyam is an Associate Editor of IEEE Transactions on Computer Aided Design of Integrated Circuits and Systems. Prof.B.Ravindran is a member of Editorial Board of Journal of Artificial Intelligence Research, an Academic Editor of Plos ONE journal and an Associate Editor of Frontiers in AI and Machine Learning journal. Prof.Krishna Sivalingam is a member of Editorial Board of IEEE Networking Letters. Prof.C.Pandurangan is a member of Editorial Board of IET Information Security journal. Dr.Venkata Krishna Nandivada is an Associate Editor of Sadhana journal.

The faculty of the Department have been involved in developing technological solutions for social problems. Dr.Mitesh Khapra and Dr.Pratyush Kumar incubated a startup named as One Fourth Labs, in the IIT Madras Research Park. The aims of the startup are to provide affordable high quality education in AI, and to engage with the government and corporations to solve problems of local relevance using AI. Dr.Venkata Krishna Nandivada and his students developed a software called LapTrac. This software has been installed in more than a million laptops distributed by the Tamil Nadu government to track the location of the laptops.

The alumni of our Department have instituted a few awards during the past one year. Mr.Bala Vamsi Tatavarthy, a dual degree student of 2005 batch, and his family instituted the Prof.B.Yegnanarayana Award for Excellence in Research and Teaching in Computer Science and Engineering. Dr.M.N.Jayalal Sarma received this award for the year 2019. The Class of 1991 Faculty Award for new Assistant Professors has been instituted by the Class of 1991. Dr.K.C.Sivaramakrishnan received this award for the year 2019. The C.Pandurangan Faculty Fellowship in Computing has been instituted by the alumni of the Department. The Anand Rajaraman and Venky Harinarayan Institute Chair has been instituted by two alumni of the Department. Prof.C.Pandurangan has been selected for this Institute Chair. Prof.Krishna Sivalingam has been selected for the Institute Chair instituted by Mr.Kris Gopalakrishnan.

The ground breaking ceremony for construction of new Annex Building for the Department was performed in June 2019. It is expected that the new Annex Building will be ready for occupation by January 2021.

The academic year 2018-2019 has been highly rewarding in terms of research publications and projects. The Department will strive to grow further and reach higher levels of accomplishment in the coming years.